

# USDA Agricultural Baseline Projections to 2008

## Interagency Agricultural Projections Committee

### Introduction

This report provides long-run baseline projections for the agricultural sector through 2008. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices.

The projections are a conditional scenario with no shocks and are based on specific assumptions regarding the macroeconomy, agricultural policy, the weather, and international developments. In particular, the baseline incorporates provisions of the Federal Agriculture Improvement and Reform Act of 1996 (1996 Farm Act) and assumes that current farm legislation remains in effect through 2008. The projections are not intended to be a Departmental forecast of what the future will be, but instead a description of what would be expected to happen under the 1996 Farm Act, with very specific external circumstances. Thus, the baseline provides a point of departure for discussion of alternative farm sector outcomes that could result under different assumptions.

The projections in this report were prepared in October through December 1998, in conjunction with the fiscal 2000 President's Budget analysis. Projections reflect a composite of model results and judgmental analysis. Normal weather is assumed. The baseline reflects major agricultural policy decisions made through mid-November 1998 and includes short-term projections from the November 1998 *World Agricultural Supply and Demand Estimates* report. The projections do not include the 5-year data revisions for agricultural commodities released by USDA's National Agricultural Statistics Service in late-1998 and 1999. Also, the baseline does not reflect effects of the recent currency devaluation in Brazil.

### Summary of Projections

This year's baseline reflects the effects of a number of international factors which have combined to weaken the U.S. agricultural trade outlook for the next 10 years, either by reducing global demand or increasing world supplies. The economic crisis in Asia and, to a lesser extent, the near-term economic contraction in Russia contribute to a prolonged period of weak global agricultural demand (see boxes, page 96 and page 106). Key to baseline projections for agricultural trade are macroeconomic assumptions depicting these situations. As such, there are two distinct parts of the macroeconomic forecast. In the near to medium term, the crisis situations and subsequent recovery dominate the outcome. For Asia, 1 to 3 years of negative growth in crisis countries are followed by a return to moderately positive economic growth. Then, in the last 5 years of the baseline, structural reform leads to more stable long-term economic growth, although projected growth for crisis-affected Asian countries is lower than in previous USDA baselines. For Russia, negative growth is assumed through 2000, with positive economic gains resuming in 2002, followed by modest growth in later years.

- C Additionally, growth in world grain trade is affected by relatively moderate gains projected for import demand by China, reflecting changes in a number of key assumptions (see box, page 93). Revised agricultural policy assumptions for China provide governmental support to rice, wheat, and corn, encouraging output and reducing import demand for these crops. Revised livestock data for China suggest significantly smaller animal inventories and lower feed grain demand throughout the baseline. Finally, an assumption of a declining real exchange rate against the U.S. dollar starting in 2001 reduces net agricultural import demand in China.
- C Global supplies for many agricultural commodities are initially large for this baseline, and expanding production potential in a number of foreign countries result in strong export competition throughout the baseline. Increased yield growth for corn, wheat, and soybeans in Argentina and conversion of undeveloped land for soybeans in Brazil, for example, are projected in the baseline (see box, page 103).

As a consequence, in the initial years of the baseline, much of the U.S. agriculture sector is adjusting to a combination of weak demand and large global supplies, before moving back toward longer term trends. In the longer run, strong export competition and only moderate grain import demand in China continue to influence the baseline projections, although more favorable global economic growth supports gains in trade and U.S. agricultural exports. This leads to rising nominal market prices, gains in farm income, and increased stability in the financial condition of the U.S. agricultural sector.

The trend toward fewer but larger farms continues in the baseline. The sector will remain highly competitive, with successful producers having strong technical and managerial skills. Management of risk will be important for farmers, reflecting the reduced role of the government in the sector under the 1996 Farm Act.

Consumer food prices are projected to continue a long-term trend of rising less than the general inflation rate. Trends in consumer food expenditures towards a larger share for meals eaten away from home are expected to continue.

### **Macroeconomic Assumptions**

The outlook for the world economy over the next 10 years reflects to a large extent the evolving Asia financial crisis, especially in the first half of the baseline. There are two distinct parts of the forecast. In the near to medium term, the crisis and subsequent recovery dominate the outlook. Negative economic growth in crisis countries for 1 to 3 years is followed by a return to moderately positive growth. Then, in the last 5 years of the baseline, structural reform in crisis countries leads to more stable long-term economic growth, although assumed growth rates are lower than previous expectations. Asian growth is assumed at 4.8 percent for 1997-2002, increasing to 6.1 percent for 2003-2008. While improving in the last 5 years of the baseline, this assumed rate of growth for Asia is 2 percentage points lower than the region's 1991-1996 average annual growth of 8.1 percent. Overall, economic growth for developing economies is slowed by the crisis in Asia, averaging under 5 percent annually in the baseline, compared to 5.4 percent during 1991-1996. The slowdown in economic growth for developing economies is important for global agricultural demand because many developing countries have incomes at

levels where consumers diversify their diets and include more meats and other higher valued food products.

For transition economies, growth is expected to remain strongest among the countries that are further along in the transformation from centrally planned to market economies. Countries of Central and Eastern Europe, particularly Poland and Hungary, are expected to show relatively strong growth. In the near term, however, crisis and structural adjustment characterize most FSU countries, with Russia and Ukraine showing negative growth through 2000. FSU countries are assumed to return to modest rates of economic growth by 2002.

Developed countries are relatively unaffected by the Asia crisis as structural adjustments undertaken throughout the second part of the 1980s and early 1990s have created a foundation for growth. Developed economies, including the United States, are projected to grow at higher rates than in the 1991-1996 period, 2.4 percent compared with 1.9 percent. Low inflation and interest rates characterize the outlook.

The economy of the United States is only moderately affected by the Asia crisis, although U.S. agriculture, as a trade-dependent sector, is very sensitive to conditions in the international economy. U.S. GDP growth is expected to average 2.5 percent in 2003-2008, compared to 2.1 percent growth during 1991-1996, reflecting growth of the labor force and gains in productivity. Inflation is projected at 3.0 percent for 2003-2008.

Despite the near-term declines in economic activity in the crisis-affected countries and their slower long-term growth, world real GDP is projected to grow by about 2.9 percent annually through 2008, compared with 2.3 percent during 1991-1996. Stronger growth in developed countries and in developing and transition countries that are not affected by the crisis account for the increase in global economic gains.

### **Agricultural Policy Assumptions**

The baseline incorporates provisions of the 1996 Farm Act and assumes a continuation of current agricultural law through the end of the projections. The baseline also includes policy decisions as of mid-November 1998.

Nearly complete planting flexibility is provided under the 1996 Farm Act, allowing producers to respond to market prices and returns, augmented by marketing loan benefits in low price years. Production flexibility contract payments are largely decoupled because they generally are not related to current plantings or to market prices. Marketing loan/loan deficiency payment provisions of the 1996 Farm Act provide an effective per-unit revenue floor at the loan rate, with a countercyclical effect occurring through marketing loan gains or loan deficiency payments when the price is below the loan rate. The 1999 Appropriations Act provided additional funds in fiscal 1999 for contract crops for market loss assistance. The total funding level provided through fiscal 2002 under the 1996 Farm Act for cotton user marketing certificates (known as the Step 2 program) was reached in December 1998, but the baseline assumes that Step 2 payments resume in fiscal 2003 when the funding for the program is no longer capped.

The baseline assumes that the Conservation Reserve Program (CRP) will gradually build from its recent level of about 30 million acres to its maximum authorized level of 36.4 million acres by 2002. New enrollments in the CRP reflect periodic regular signups and continuous signups. A competitive selection process is used for CRP enrollments. CRP enrollment bids compete for acceptance into the program, based on an environmental benefits index with government costs taken into account.

The baseline assumes full compliance with all bilateral and multilateral agreements affecting agriculture and agricultural trade. Projections assume full compliance with the internal support, market access, and export subsidy provisions of the Uruguay Round (UR) Agreement on Agriculture. The baseline assumes no accession to the World Trade Organization (WTO) by the FSU, China, or Taiwan; no enlargement of the European Union beyond its current 15 members; no implementation of more liberalized trade among the countries of the Asia-Pacific Economic Cooperation; and no expansion of the North American Free Trade Agreement. Agricultural and trade policies in individual foreign countries are assumed to continue to evolve along their current paths.

Annual quantity and expenditure levels for the Export Enhancement Program (EEP) are assumed to be in compliance with reductions in the UR agreement. The baseline assumes that no EEP expenditures occur in fiscal 1999, with EEP expenditures then assumed to resume in the baseline at funding levels set in the 1996 Farm Act of \$579 million in FY 2000 and \$478 million in FY 2001 and FY 2002. The baseline assumes EEP funding remains at \$478 million for subsequent years as well.

P.L. 480 program levels decline in fiscal years 2000 and 2001 and are then assumed constant for the rest of the baseline. Program levels projected for the GSM-102 and GSM-103 credit guarantee programs are nearly constant in the baseline. No special donations beyond the fiscal 1999 Section 416(b) shipments of wheat to Russia and other needy countries are assumed.

## **Crops**

In the initial years of the baseline, many crops are adjusting to a combination of weak demand due in part to the Asia financial crisis and large global supplies, before moving back towards longer term trends with more robust growth. World demand is reduced for many U.S. crops over the first few years of the baseline, 1999/2000 to 2001/02. In the longer run, more favorable global economic growth supports increases in trade and U.S. agricultural exports, although gains are somewhat muted by continued strong export competition and only moderate growth in import demand in some markets, such as for grains to China.

Planted acreage for the eight major U.S. field crops (corn, sorghum, barley, oats, wheat, rice, upland cotton, and soybeans) increases nearly 10 million acres by 2008 from 1998 levels, surpassing the recent high level of plantings for these crops attained in 1996. However, reflecting low prices for many crops due to weak demand and large global supplies, aggregate area planted to these crops declines somewhat over the next few years before turning upward again in 2002. Planting flexibility of current agricultural legislation facilitates acreage movements by allowing producers to respond to market prices and returns, augmented by

marketing loan benefits in low price years. Marketing loan benefits influence the cropping mix somewhat in the early years of the baseline when many prices are relatively low, but projected acreage gains in the longer term reflect land drawn into production based on strengthening market incentives. Yield gains for many crops are sufficient to mitigate some of the pressure on total land use.

Projected gains in demand for U.S. soybeans, barley, and rice are driven primarily by domestic markets, with larger absolute increases and growth rates than exports. Increases in corn use also are larger in the domestic market than in trade, although corn exports have a higher growth rate. Strong competition in global corn trade from Argentina as well as moderate world import demand growth, particularly for China, which is projected in the baseline to be a net corn exporter until 2005/06, combine to mute U.S. corn export gains. Increases in disappearance for U.S. wheat, sorghum, and cotton are driven by exports, with U.S. trade gains that are larger in absolute terms and growth rates than for domestic demand. U.S. wheat exports rise steadily in the baseline but face greater competition from the European Union (EU) starting in 2002/03 when the EU is projected to be able to export wheat without subsidies. Cotton exports benefit from the assumed resumption of Step 2 payments in 2002/03.

Domestic demand for most crops is projected to grow slightly faster than population. Growth in domestic use of rice reflects a greater emphasis on dietary concerns and an increasing share of domestic population from Asia and Latin America. Gains in corn sweetener use and corn used for ethanol production also exceed population growth rates. Increases in domestic soybean crush reflect continued strong growth in poultry production and demand for soybean meal. Domestic wheat use, however, is nearly flat as declining feed use offsets food use gains. Greater U.S. exports of cotton yarn, fabric, and semi-finished products will promote growth in domestic mill use of cotton, although increases in textile imports, mostly apparel, and competition from man-made fibers limit domestic gains.

Stocks-to-use ratios decline for corn, wheat, and soybeans, with nominal prices rising. Rice stocks-to-use ratios change little in the baseline, with relatively smaller increases in nominal prices. Stocks-to-use ratios for cotton also change little in the baseline.

## **Livestock**

Changes in the U.S. meat complex in the near term reflect the sharp decline of grain and soybean meal prices from the very high levels of the 1995/96 crop year. In the longer run, lower feed prices than in 1995/96, replenishment of forage supplies, low inflation, domestic demand strength, and gains in export sales are expected to contribute to producer returns that encourage higher pork and poultry output, although only moderate cyclical expansion is projected for beef. Record total meat supplies are projected through the baseline, with a larger proportion of poultry.

The cattle herd builds up only slightly from a cyclical low near 97 million head in 2000, remaining below 100 million head in 2002-2004 before turning downward again as producer returns provide economic incentives for only a brief and moderate expansion. Additionally, shifts toward a breeding herd of larger-framed cattle and heavy slaughter weights partially offset the need for further expansion of cattle inventories. The beef production mix continues to shift

toward a larger proportion of fed beef, with almost all steers and heifers being feedlot fed. Beef production also continues to move toward a higher graded product being directed toward the hotel-restaurant and export markets. The U.S. remains the primary source of high-quality, fed beef for export, including hotel-restaurant trade. However, the emergence of the United States as a long-term net beef exporter will be delayed until near the end of the baseline, after the cow herd is reestablished and weak demand in the Pacific Rim recovers.

The pork sector will continue to transform into a more vertically coordinated industry with a mix of production and marketing contracts. Larger, more efficient pork producers will market a greater percentage of the hogs over the next 10 years. With a more vertically coordinated industry structure, the hog cycle is dampened. As a result, a slow expansion in pork production begins in 2002 and continues for the remainder of the baseline. The United States becomes an increasingly important net pork exporter, in part reflecting environmental constraints for a number of competitors that limit their production gains. However, projected gains in U.S. pork exports are somewhat muted by reduced market growth prospects in the Pacific Rim and Russia.

Continued technological advances and improved production management practices are expected in the broiler and turkey industries, although gains are not anticipated to hold down production costs as significantly as in the past 10 years. Competition in global poultry markets holds U.S. poultry exports to moderate gains. Following slower growth in sales to Asia and a sharp reduction in exports to Russia in 1998 and 1999, a slow recovery is projected for poultry exports to both markets.

Decreases in real prices of meats combined with increases in real disposable income allow consumers to purchase more total meat with a smaller proportion of disposable income. Poultry gains a larger proportion of both total meat consumption and total meat expenditures, reflecting its lower production costs and prices relative to other meats. On a retail weight basis, poultry consumption is projected to exceed red meat consumption at the end of the baseline.

The structure of individual meat producing sectors is changing as meats compete with each other for consumer market share (see box, page 68). Both production and marketing practices are affected as the meat producing sectors respond to perceived consumer demand. The beef sector is moving toward an increasingly segmented market, with higher graded, consistent-quality production being directed toward the hotel-restaurant and export markets and generally less desirable quality beef competing with pork and poultry in retail markets. Increased vertical coordination in pork production will lower production costs and improve pork quality and consistency of product, allowing pork to increasingly challenge beef in the hotel-restaurant market as well as at retail. The poultry sector, already with a highly integrated structure, continues to develop new products with the current trend toward home meal replacement in grocery stores.

Per capita consumption of eggs stabilizes in the baseline as greater use of eggs in processed foods, reflecting consumer use of more convenience foods, offsets declining shell egg use.

High milk-feed price ratios and dairy productivity gains push milk output per cow higher. Milk production grows despite slowly declining cow numbers. Lower real milk prices continue to

push weaker operations out of dairying. Milk production will expand in the West as well as on large-scale dairy farms in the North. Expansion in commercial use of dairy products will be led by sales of cheese and dairy ingredients for processed foods, while fluid milk sales are stagnant.

### **Farm Income and Farm Financial Conditions**

Farm income and financial conditions in the U.S. agricultural sector reflect adjustments in the near-term, followed by improvements beyond 2000 through the end of the baseline. The agricultural sector remains financially strong in the aggregate throughout the projections.

Reflecting the initial weakness in the sector, net farm income declines in the first few years of the baseline, falling to about \$44 billion in 2000, slightly below the 1990-1997 average. Lower farm commodity receipts due to large global supplies and weak demand are the main cause of the near-term decline in farm income. Lower production expenses in the initial years, particularly for farm-origin inputs, energy-related costs, and interest expenses, offset some of the reduction in cash receipts. Additionally, increased government payments bolster farm incomes for 1998 and 1999.

Beyond 2000, due largely to strengthening demand, net farm income gradually moves upward for the rest of the baseline, exceeding \$50 billion for the last few years of the projections. Nonetheless, gains in farm income are less than inflation, so real farm income declines. The agriculture sector increasingly relies on the marketplace for its income as direct government payments fall and represent about 2 percent of gross cash income by 2008. Both crop and livestock receipts are up in nominal terms due to larger production and higher prices. Production expenses increase in the baseline, with expenses for non-farm origin inputs rising faster than expenses for farm-origin inputs. Cash operating margins tighten somewhat, with cash expenses increasing to about 79 percent of gross cash income by 2008.

Higher nominal farm incomes and relatively low interest rates assist in asset accumulation and debt management, thus leading to an improved balance sheet for the farm sector. Farm asset values increase through the baseline, led by gains in agricultural land values. Increases in farm debt rise less rapidly and are not beyond the ability of farmers to service the debt. As a result, debt-to-asset ratios continue the downward trend of the last decade from the high levels of over 20 percent in the mid-1980s, declining to near 13 percent by the end of the baseline. With asset values increasing more than debt, farm equity rises significantly. Increasing nominal farm income in the baseline, combined with rising farm equity, means relative stability in the financial condition of the farm sector.

Management of risk will be important for farmers to buffer potential income variability due to supply and demand variations. The trend toward fewer but larger farms will continue, as producers who are more efficient and better managers acquire the production resources of exiting farmers.

## **Food Prices and Expenditures**

Retail food prices in the baseline are projected to rise less than the general inflation rate, continuing a long-term trend. The largest price increases generally occur among the more highly processed foods, such as cereals and bakery products and other prepared foods. Prices of these foods are related more to the costs of processing and marketing than to the costs of farm commodities. Expenditures for meals eaten away from home account for a growing share of food spending, reaching almost half of total food spending by 2008.

## **Agricultural Trade**

Growth in global and U.S. agricultural trade will be slowed over the next 2 to 3 years by weakened demand in key markets, particularly in Asia and the former Soviet Union. Global trade will, however, continue to be supported by demand in other developing country markets in Latin America, North Africa, and the Middle East. In the near term, U.S. farm exports are likely to face increased competition stemming from productivity gains by other exporters, particularly Argentina, and from developing and transition economies where currencies have been sharply devalued.

Longer term prospects for global and U.S. trade remain relatively bright. Based on the outlook for an Asian recovery after 3 to 4 years, trade expansion will be driven by generally favorable economic growth in developing countries, and freer trade associated with ongoing unilateral policy reforms and existing multilateral reforms. Relatively strong longer term growth in the volume of global trade in bulk agricultural commodities is projected, with broad-based expansion across developing regions, including China, South and Southeast Asia, Latin America, North Africa, and the Middle East. Income growth in developing countries will continue to have a large impact on demand for agricultural goods, both through increases in direct food use and through derived demand for livestock feeds to meet rising meat demand.

Future trends in China's agricultural trade remain an important question in the global outlook. Significant uncertainty regarding basic data and future policies, combined with the size of China's agricultural economy, make alternative trade projections both plausible and globally significant. The current projections indicate only modest growth in China's import demand for most bulk commodities, particularly wheat and coarse grains.

In the near term, world commodity prices will be depressed by the combination of weakened global demand and increased exportable supplies from traditional and nontraditional competitors. Prices are projected to strengthen over the longer term, as supplies adjust and a recovery in Asian demand is added to steady growth in other regions. However, real prices are projected to continue to decline over the longer term, as productivity gains continue to outpace growth in demand.

Trade in grains is expected to lead the stronger projected growth of bulk commodity trade during 2000-2008. Projected growth in coarse grain trade is particularly strong, predicated on rising incomes in developing regions, diet diversification, and increased demand for livestock products and feeds. Wheat and vegetable oil trade will also continue to expand in response to rising

incomes in developing countries. Trade in soybeans and meal will benefit from the expansion of developing country feed-livestock sectors. Raw cotton demand and trade beyond 2000 are projected to be stronger than in the 1990s, but slower than in the 1980s when there was increased substitution of cotton for synthetic fibers.

U.S. export growth is projected to strengthen for most bulk commodities over the longer term. U.S. wheat and coarse grain exports are projected to expand the fastest, although competition is expected to increase in both markets. By the middle of the projection period, U.S. wheat export growth is projected to slow as stronger world wheat prices and lower internal prices in the European Union (EU) permit the EU to export wheat without subsidies. Little growth in U.S. rice exports is projected, as domestic demand captures most of the gains in U.S. production. U.S. exports of soybeans and products are projected to rise faster than in the 1980s, aided by both yield and acreage gains. U.S. raw cotton exports are projected to strengthen through most of the baseline, benefiting from rising demand and reduced competition in some countries.

Global meat demand and trade and U.S. meat exports will be depressed in the near term by the slowdown in import demand in East Asia and the FSU. Growth in meat trade is, however, projected to resume after 2000, as demand recovers in these key market regions. Already negotiated reductions in trade barriers will support growth in meat trade in East Asia. FSU import demand is likely to be depressed for 3 to 5 years by the impacts of the recent economic crisis.

The total value of U.S. agricultural exports is projected to decline in 1999 and 2000, but then increases to almost \$73 billion by 2008. Weak global demand and prices hold down the value of U.S. bulk and high-value product (HVP) exports early in the baseline. After 2000, however, both bulk and HVP exports are projected to strengthen for the rest of the baseline. U.S. imports rise to \$50 billion, resulting in an agricultural trade surplus in fiscal 2008 of nearly \$23 billion.